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May 20, 1969

Mr. Jay Ballard
Chief Engineer
WMUA
University of Massachusetts
Amherst, Massachusetts 01002

Dear Mr. Ballard:

As you advised me in our telephone conversation, there seems to be a difference of opinion regarding the technical changes for WMUA. It might therefore be wise to elaborate a bit further on the points discussed in my letter of last August.

In that letter we included a recommendation that the present 10-watt operation be tried out at the Orchard Hill dormitories. We made this recommendation with the understanding that WMUA was basically concerned with coverage of the campus, rather than service to Amherst and the surrounding area, since the continuance of 10-watt operation is attractive from a cost and operational standpoint. Based on later conversations, however, it seems that such an operation would not conform to the apparent needs of WMUA.

In order for WMUA to provide good service to Amherst and to the campus, we feel that an operation similar to that now proposed would be necessary. When all is said and done, the selection of facilities for a given station should follow a reasonable chain of logic. The first and most important step is the selection of the best possible site, which seems to be Orchard Hill. The next step is to decide upon the radiated power to be employed, which is, of course, a function of the size of the area to be served. In the case of WMUA, effective radiated power should be at least 1 kw to do the job, and preferably more. Finally, one must decide on a combination of transmitter and antenna, and whether circular polarization can be employed without curtailing coverage to any great extent. (Since the overall coverage is determined by the horizontally-polarized radiation, energy put into the antenna which is radiated with other than horizontal polarization reinforces the horizontal signal, but does not help to extend the service area. Therefore, there must be sufficient transmitter power and/or antenna gain to compensate for the energy which is "lost" through circular polarization.) The combination of a one kilowatt transmitter with a four-section, circularly polarized antenna, would provide slightly less than 2 kw of horizontally-polarized radiated power, which should be sufficient for the needs of WMUA, and which is the most reasonable and inexpensive transmitter-antenna combination for such facilities.

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There are, of course, many other possible combinations which might accomplish the objective. For instance, one could approach the proposed level of service through the use of a low power transmitter and a high-gain antenna, perhaps modified for directional operation. We cannot, however, recommend such a system. Although there are those who will disagree with us, we believe in using a transmitter of sufficient output to permit the use of a relatively simple antenna system. On paper, this may sometimes seem less economical than another approach, but in practice there is no substitute for transmitter power. Furthermore, when one gets involved with special antennas with horizontal directivity or special beam tilt and/or null fill, the costs and problems soar. For these reasons, most applications for Class A commercial FM stations, all of which specify power similar to that which you propose, call for antenna-transmitter combinations similar to yours. It is only a rare occasion when an application specifies something drastically different.

On this basis, we would make the following two recommendations:

1. If coverage of only the campus is desired, WMUA might accomplish this with a 10-watt operation at Orchard Hill, with minimum expense.

2. If coverage of Amherst and other nearby areas around the campus is desired, we do not believe that a 10-watt transmitter would be sufficient, and would recommend the use of a 1 kw transmitter and circularly polarized antenna, as you have proposed.

We all know, of course, that there is no way in the world to determine exactly how effective your coverage will be with the new facilities. We <u>do</u> know that it will be vastly superior to present coverage, and substantially better than that which would be obtained from a relocated 10-watt station (approximately 200 times better, from the standpoint of received signal level). We therefore think you have made a wise decision for WMUA, and we are in complete agreement.

Yours very truly,

KEAR AND KENNEDY

Neil M. Smith

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